

## ABSTRACT OF THE DISCLOSURE

A synchronous motor controlling apparatus which can be applied to the carrier synchronized position estimating method as well and have protection-related functions such as detection of inverted magnetic pole position of a motor in a simple method, and an electric motor using the synchronous motor control apparatus. A controller controls a voltage applied to an AC motor with a PWM signal. A magnetic pole position detector of the controller detects a current of the AC motor to estimate a pole position of the AC motor. A fault detector detects a fault in the estimated magnetic position of the AC motor.

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